HIGH CHEMICAL TOXICANT LEVELS AMONG URBAN POPULATION WITH HISTORY OF LIVING IN AGRICULTURAL AREAS OR USE OF PESTICIDES

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Background and aims: there are many chemical toxicants in the environment capable of producing adverse health effects. Surveillance systems using bio-markers are a tool to identify potentially exposed populations and sources of exposure. A study was conducted to assess the feasibility of implementing such a system in Brazil using multiple biologic matrices.

Methods: blood and hair samples were obtained from blood donors attending 10 donation centers in the metropolitan region of Sao Paulo. Hair and blood levels of metals (Hg, As, Cd, Co, Cu, Mn, Pb, Se, Tl, U, Zn, Pt, and Sb) were determined by ICP-MS. Serum levels of organochlorines were determined by gas chromatography. A detailed questionnaire was also applied to each participant.

Results: 547 blood donors aged 18-65 year old (mean 34.8) were included in the study (64.7% male). Levels of most metals were similar to those reported in other surveys except for mercury in blood with 3 individuals with levels greater than 15 µg/L. Lead and cadmium in blood, but not in hair, were significantly higher among smokers and mercury among those with higher fish consumption. Arsenic levels in hair were significantly higher among those who lived in agricultural areas (0.025 x 0.018 µg/g) or with history of dealing with pesticides in the past (0.037 x 0.019 µg/g), while blood levels of this metal were higher for those that reported eating home grown vegetables. Levels of β-HCH, pp´DDE, cobalt, lead and thallium were also higher among those with possible pesticide exposure in the past. Correlations between hair and blood measurements were low with the highest correlation for mercury (r=0.45 p<0.001).

Conclusion: Methodologies tested in this study will help the implementation of a monitoring system in Brazil. Results evidenced possible sources of contamination such as pesticides or fertilizers used in the past that must be further investigated.